Table 1. Cross-tabulation of survey designs and common objectives for sampling freshwater mussels. Survey designs are combinations of sampling designs and collection methods. We exclude survey designs that are unlikely to be applied (e.g., complete coverage with excavation). We indicate the survey designs that we recommend (R), recommend with reservation (RWR), or do not recommend (NR) under common objectives.

Sampling design	Collection method	Common name for design	Result	Cost	Common objectives				
					Species presence	Population density or size	Detecting an impact	Monitoring species presence	Monitoring population density or size
Complete coverage[1]	Superficial visual/tactile search of substrate surface[2]	Qualitative sampling or timed search	Species list	High	NR	NR	NR	NR	NR
	Detailed visual/tactile search of substrate surface[3]	Semi-quantitative census	Surface density and species list	High	NR	NR	NR	NR	NR
Informal sampling[4]	Superficial or detailed visual/tactile search of substrate surface[2]	Qualitative sampling or timed search	Species list	Low	RWR[6]	NR	NR	RWR[6]	NR

Probability-based sampling	Detailed visual/tactile search of substrate surface within sampling units[3]	Semi-quantitative sampling	Estimate of surface density and species list	Med	R	NR	NR	R	NR
	Excavation of sampling units[5]	Quantitative sampling	Estimate of total density	High	NR	R	R	NR	R

[1] Extremely time-consuming. Useful only for research purposes and very small sites.

[2] Search efficiency and proportion visible at substrate surface varies with place, time, and taxon. Variation in search efficiency and proportion at surface could confound spatial, temporal, and taxonomic comparisons.

[3] Proportion visible at the substrate surface varies with place, time, and taxon. Variation in proportion at the surface could confound spatial, temporal, and taxonomic comparisons.

[4] Unlikely to yield a representative sample. There is no valid way to measure uncertainty.

[5] Excavation of sediment is time-consuming and potentially damaging to mussels and their habitat. Amount of excavation needed to estimate total abundance could be reduced by use of double sampling design.

[6] Validity of qualitative sampling is determined by amount of search effort and coverage of the site. The relationship between species detection and search effort in qualitative sampling is poorly understood, but see Metcalfe-Smith (2000) for an empirical study.